

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-39, 45-61, 64-70, 73-102, 106, and 107 are pending in the present application. Claims 1, 45-48, 64-66, 73, 82, 106, and 107 are amended by the present amendment.

In the outstanding Office Action, Claims 1, 45-48, 73, 82, and 107 were objected to; Claims 73-81 were rejected under 35 U.S.C. § 102(b) as anticipated by Gelbart (U.S. Patent No. 6,147,789); Claims 1-39, 45, 47, 66-70, 82-102, and 107 were rejected under 35 U.S.C. § 103(a) as unpatentable over Gelbart in view of Furlani et al. (U.S. Patent No. 5,793,519, herein "Furlani"); Claims 48-61 and 65 were rejected under 35 U.S.C. § 103(a) as unpatentable over Gelbart in view of Furlani and Arney et al. (U.S. Patent No. 5,751,469, herein "Arney"); and Claims 46, 64, and 106 were rejected under 35 U.S.C. §103(a) as unpatentable over Gelbart in view of Furlani, Arney and Saito et al. (U.S. Patent No. 6,272,304 B1, herein "Saito").

Applicants note an Information Disclosure Statement (IDS) was filed on March 28, 2002, which at this time has not been indicated as considered. Applicants respectfully request the Examiner to consider the references provided with that IDS. Copies of the filed IDS, the PTO-1449 form, and the date-stamped Filing Receipt are enclosed herewith for the Examiner's convenience. Applicants respectfully request the PTO-1449 form be initialed and returned to Applicants' U.S. representative.

Applicants thank Examiner Tra for the courtesy of an interview extended to Applicants' representative on January 24, 2005. During the interview differences between the claims and the applied art were discussed. Further, claim amendments clarifying the claims over the applied art were discussed. The present response sets forth those discussed

claim amendments. Examiner Tra indicated he would further review the amended claims in view of a filed response. Arguments presented during the interview are reiterated below.

Regarding the objection to Claims 1, 45-48, 73, 82, and 107, Applicants respectfully submit that the specification discloses at page 33, line 7, to page 34, line 5, that “the direction of the reflected light of each incident light beam (R) is disturbed.” Further, Figure 4 shows in detail how the direction of each incident light is disturbed. As discussed during the interview, one of ordinary skill in the art of optics would recognize that Figure 4 shows the reflected light as following random directions.

However, to clarify the description of Figure 4 and as suggested by Examiner Tra during the interview, the specification is amended at page 33, lines 7-20, to recite the term “random directions.” Thus, Applicants respectfully submit that Claims 1, 45-48, 73, 82, and 107 find support in Figure 4 and in the amended specification and respectfully request this objection be withdrawn.

Claims 73-81 were rejected under 35 U.S.C. § 102(b) as anticipated by Gelbart. That rejection is respectfully traversed.

Independent Claim 73 is amended to recite:

said beam is configured to deform along said gap such that said light reflection surface has an irregular shape when said beam is driven and a light emitted from said light emission element is reflected by said light reflection surface in random directions when said beam is driven and in one direction when said beam is not driven.

The claim amendment finds support in Figure 4 and in the specification as amended at page 33, lines 7-20. No new matter is believed to be added.

Briefly recapitulating, independent Claim 73 is directed to a light modulator that has a beam opposed to a fixed electrode through a gap and has a light reflection surface. The beam is configured to deform along the gap such that the light reflection surface has an irregular shape when the beam is driven by a driving voltage and a light emitted from a light emission

element is reflected by the light reflection surface in random directions when the beam is driven and in one direction when the beam is not driven.

In a non-limiting example, Figure 4 shows the light (R) reflected in random directions by the light reflection surface 1. As discussed in the specification at page 33, line 17, to page 34, line 5, each of the light reflected by the light reflection surface 1 is disturbed and the reflected light has no preferential direction because the light reflection surface has an irregular shape when the beam is driven by a driving voltage.

The light modulator of Claim 73 advantageously controls a direction of the reflected light when a driving voltage is applied by controlling a slope of the gap determined by the fixed electrode because the beam deforms along the gap. In addition, a precise adjustment of the electrostatic attraction is not necessary for the beam of Claim 73 as the gap determines the shape of the beam. On the contrary, the metal coating 2 of Gelbart should be precisely deformed by the electrostatic attraction to deform the metal coating to have the shape of a cylindrical mirror.

Turning to the applied art, Gelbart shows in Figures 1A and 1B a beam 1 having a light reflection surface 2 that reflects light in a preferential direction (see Figure 1A) when no voltage is applied to the beam 1 by a fixed electrode 5. The light is reflected to a slit 9 (see Figure 1B) along a preferential direction by the light reflection surface 2 when a voltage is applied between the fixed electrode 5 and the beam 1 to deform the light reflection surface 2 to become a spherical mirror. Gelbart specifically discloses at column 3, lines 6-15, that “the cylindrical shape of the ribbon resulting from the relative downward deflection of the mirror surface electrode 2 causes the reflected beam to come to a focus at the slit 9 formed in the barrier.”

Thus, as discussed during the interview, Gelbart discloses a light reflection surface that has a regular shape (a cylindrical mirror) and the light reflected in Figure 1B in Gelbart is

not in random directions as required by Claim 73, but the light is reflected along a specific direction such that all the reflected light focuses on the slit 9. Applicants note that a surface having an irregular shape cannot focus the light on the slit 9. Further, Applicants respectfully submit that one of ordinary skill in the art would not consider that a “mirror” as in Gelbart reflects light in random directions.

Therefore, Gelbart does not teach or suggest a light modulator that (i) has a light reflection surface configured to have an irregular shape when driven by a driving voltage, and (ii) reflects light on the light reflection surface having the irregular shape in random directions, as required in independent Claim 73.

Accordingly, it is respectfully submitted that independent Claim 73 and each of the claims dependent therefrom patentably distinguish over Gelbart.

Claims 1-39, 45, 47, 66-70, 82-102, and 107 were rejected under 35 U.S.C. § 103(a) as unpatentable over Gelbart in view of Furlani. That rejection is respectfully traversed.

Independent Claims 1, 45, 47, 66, 82, and 107 are amended similar to independent Claim 73, discussed above. As noted above, Gelbart does not teach or suggest these features.

The outstanding Office Action relies on Furlani for teaching a micromolded integrated ceramic light reflector having a substrate with a concave section. However, Furlani does not overcome the deficiencies of Gelbart discussed above.

In addition, as recognized in the outstanding Office Action at the paragraph bridging pages 5 and 6, “Gelbart does not disclose a substrate which has concave section in which the substrate electrode having the opposed surface is formed and which holds a to-be-held section of the center beam.” The outstanding Office Action relies on Furlani for teaching a substrate 12 having a section with a curved shape at one side of the section, as shown in Figure 3. However, Applicants respectfully note that Furlani specifically shows in Figure 3 and in all the other figures a cantilever 18 that is fixed only at one end on the substrate 12 and

the substrate has the concave section only at the free end of the cantilever 18. Thus, Furlani teaches a thin film 18 with one end fixed and one end free (a cantilever) and a substrate having a concave section only at the free end of the cantilever. On the contrary, Figures 1A and 1B of Gelbart show that the thin film 1 is fixed at both ends of the substrate 3 (thus, no cantilever) and the substrate 3 does not have any concave section. Therefore, Applicants respectfully submit that the combination of Gelbart and Furlani is based on an impermissible hindsight reconstruction as one of ordinary skill in the art would not combine the teachings of Gelbart with the teachings of Furlani because Furlani teaches a cantilever and Gelbart teaches a thin film with both ends fixed, which functions differently than the cantilever.

Accordingly, it is respectfully submitted that independent Claims 1, 45, 47, 66, 82, and 107 and each of the claims depending therefrom patentably distinguish over Gelbart and Furlani, either alone or in combination.

Claims 48-61 and 65 were rejected under 35 U.S.C. § 103(a) as unpatentable over Gelbart, Furlani, and Arney. That rejection is respectfully traversed.

Independent Claims 48 and 65 are amended similar to independent Claim 73 discussed above. As noted above, Gelbart and Furlani, either alone or in combination, do not teach or suggest the claimed features.

The outstanding Office Action relies on Arney for teaching an apparatus for an improved light modulator with a hole in a thin film above a gap. However, Furlani does not overcome the deficiencies of Gelbart and Furlani discussed above.

Thus, it is respectfully submitted that independent Claims 48 and 65 and each of the claims depending therefrom patentably distinguish over Gelbart, Furlani, and Arney, either alone or in combination.

Claims 46, 64, and 106 were rejected under 35 U.S.C. § 103(a) as unpatentable over Gelbart in view of Furlani, Arney, and Saito. That rejection is respectfully traversed.

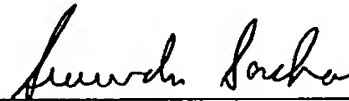
Independent Claims 46, 64, and 106 are amended similar to independent Claim 73. The outstanding Office Action relies on Saito for teaching a latent image formation unit, a developing unit, and a transfer unit. However, Saito does not overcome the deficiencies of Gelbart, Furlani, and Arney discussed above.

Accordingly, it is respectfully submitted that independent Claims 46, 64, and 106 patentably distinguish over Gelbart, Furlani, Arney, and Saito, either alone or in combination.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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OSMM&N File No. 218290US2

Dept.: PP

Serial No. 10/050,865

By: MJS/smc

In the matter of the Application of: Kouichi OHTAKA, et al.

For: OPTICAL MODULATOR, OPTICAL MODULATOR MANUFACTURING METHOD, LIGHT INFORMATION PROCESSING APPARATUS INCLUDING OPTICAL MODULATOR, IMAGE FORMATION APPARATUS INCLUDING OPTICAL MODULATOR, AND IMAGE PROJECTION AND DISPLAY APPARATUS INCLUDING OPTICAL MODULATOR

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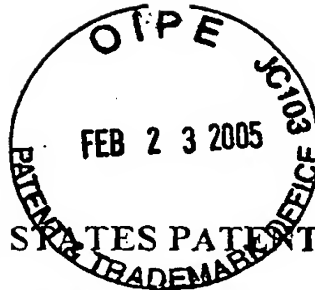
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| <input type="checkbox"/> pp. Specification & Claims/Drawings | Sheets |
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| <input type="checkbox"/> Utility Patent Application | <input type="checkbox"/> CPA |
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| <input checked="" type="checkbox"/> Cited References (12) | |
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Due date: 04/19/02

Docket No. 218290US2/smc



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IN RE APPLICATION OF: Kouichi OHTAKA, et al.

SERIAL NO: 10/050,865

GAU: 2872

FILED: January 18, 2002

EXAMINER:

FOR: OPTICAL MODULATOR, OPTICAL MODULATOR MANUFACTURING METHOD, LIGHT INFORMATION PROCESSING APPARATUS INCLUDING OPTICAL MODULATOR, IMAGE FORMATION APPARATUS INCLUDING OPTICAL MODULATOR, AND IMAGE PROJECTION AND DISPLAY APPARATUS INCLUDING OPTICAL MODULATOR

INFORMATION DISCLOSURE/RELATED CASE STATEMENT UNDER 37 CFR 1.97

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Applicant(s) wish to disclose the following information.

REFERENCES

- ☒ The applicant(s) wish to make of record the references listed on the attached form PTO-1449. Copies of the listed references are attached, where required, as are either statements of relevancy or any readily available English translations of pertinent portions of any non-English language references.
- ☐ A check is attached in the amount required under 37 CFR §1.17(p).

RELATED CASES

- ☐ Attached is a list of applicant's pending application(s) or issued patent(s) which may be related to the present application. A copy of the patent(s), together with a copy of the claims and drawings of the pending application(s) is attached along with PTO 1449.
- ☐ A check is attached in the amount required under 37 CFR §1.17(p).

CERTIFICATION

- ☐ Each item of information contained in this information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.
- ☐ No item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the undersigned, having made reasonable inquiry, was known to any individual designated in 37 CFR §1.56(c) more than three months prior to the filing of this statement.

DEPOSIT ACCOUNT

- ☒ Please charge any additional fees for the papers being filed herewith and for which no check is enclosed herewith, or credit any overpayment to deposit account number 15-0030. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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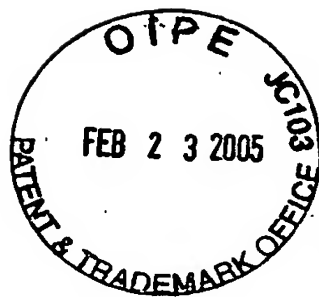


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Sheet 1 of 1

Group Art Unit: 2872

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STATEMENT OF RELEVANCY

References AM, AN, AP and AR on Form 1449:

These references are discussed in the specification.

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Form PTO 1445
(Modified)

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10/050,865

LIST OF REFERENCES CITED BY APPLICANT

APPLICANT

Kouichi OHTAKA, et al.

FILING DATE

January 18, 2002

GROUP

2872

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	AA						
	AB						
	AC						
	AD						
	AE						
	AF						
	AG						
	AH						
	AI						
	AJ						

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION YES	NO
	AK	6-138403	05/20/94	JAPAN (with English Abstract)		X
	AL	7-218845	08/18/95	JAPAN (with English Abstract)		X
	AM	2000-2842	01/07/2000	JAPAN (with English Abstract)		X
	AN	10-510374	10/06/98	JAPAN (with corr. WO 96/41217)		X
	AO	WO 96/41217	12/19/96	WIPO		
	AP	2941952	08/30/99	JAPAN (with corr. WO 96/41224)		X
	AQ	WO 96/41224	12/19/96	WIPO		
	AR	3016871	03/06/2000	JAPAN (with corr. WO 96/41226)		X
	AS	WO 96/41226	12/19/96	WIPO		
	AT					
	AU					
	AV					

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, etc.)

	AW	K. E. PETERSEN, Applied Physics Letters, vol. 31, no. 8, pages 521-523, "MICROMECHANICAL LIGHT MODULATOR ARRAY FABRICATED ON SILICON", October 15, 1977
	AX	O. SOLGAARD, et al., Optics Letters, vol. 17, no. 9, pages 688-690, "DEFORMABLE GRATING OPTICAL MODULATOR", May 1, 1992
	AY	Larry J. HORNBECK, SPIE Critical Reviews Series, vol. 1150, pages 86-102, "DEFORMABLE-MIRROR SPATIAL LIGHT MODULATORS", August, 1989
	AZ	

Examiner

Date Considered

*Examiner: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.